

STRESSES AND DEFORMATIONS IN THE CONTACT ZONE OF A LONGITUDINAL SECTION BETWEEN CYLINDERS OF COLD ROLLING

Aurel-Dan Maimon¹, Liviu Stoicescu²

¹ArcelorMittal Galati S.A. Romania, Department of Maintenance and Projects

²University "Dunarea de Jos" of Galati, Department of Naval Structures

Corresponding author: Aurel-Dan Maimon, maimon2007@gmail.com

Abstract: Elasto-plastic contact stresses in a longitudinal section between work cylinder and support cylinder of cold rolling using FEM is presented in this paper. For modelling this contact were modelled the two cylinders through two plane strips connected through compression gaps in the contact zone under one generatrix of the cylinders. Numerical analyse was done considering the material with both elastic and elasto-plastic behaviour. On equivalent stresses calculus it was included also the tangential stress of free torsion Saint-Venant (circular section) from the work cylinder torsion. The load which was applied on the work cylinder was the pressure normal on the cylinder generatrix resulted through numerical modelling of the rolling process. This pressure was considered uniform distributed on the width of the rolled strip. The present paper is appropriateness for ModTech2009 considering the "Flexible manufacturing" topic and "Maintenance, reliability, life cycle, time and cost" topic.

Key words: cold rolling, elasto-plastic contact stresses, compression gaps, numerical modelling, rolling process.